



RESEARCH DEPARTMENT

BAND III EXPERIMENTAL TRANSMISSIONS FROM KIRK O' SHOTTS

Report No. K-125

(1957/12)

**THE BRITISH BROADCASTING CORPORATION
ENGINEERING DIVISION**

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BAND III EXPERIMENTAL TRANSMISSIONS FROM KIRK O' SHOTTS

SUMMARY

A field strength survey has been made to determine the area that could be served by a Band III television transmitter of effective radiated power (e.r.p.) 100 kW at Kirk o' Shotts. The results show that most of the highly populated central areas between the Clyde and the Forth would receive a satisfactory service, with the exception of a small area in Edinburgh and Portobello where the field strength would be less than 0.5 mV/m. Neither Perth nor Dundee could be considered to be within the reliable service area.

1. INTRODUCTION

In a plan for a second B.B.C. television programme in the United Kingdom on Band III, it was proposed that one transmitter should be sited at Kirk o' Shotts. To determine the service area of such a transmitter an experimental low-power transmitter was installed at Kirk o' Shotts on a frequency of 199 Mc/s. The transmitting aerial was mounted on the existing mast at a height of 594 ft (181 m) above ground level and radiated a vertically polarised transmission with a maximum e.r.p. of 865 watts.

The field strength measuring equipment and technique was similar to that used on the experimental Band III survey at Holme Moss (see Research Department Report No. K-111 (1956/13)).

All field strengths quoted in this report are for an e.r.p. of 100 kW and for a receiving aerial height of 30 ft (9.2 m) above ground level.

2. RESULTS

Fig. 1 (map T.370) is a map of the whole area showing the positions of the median field strength contours from 50 mV/m to 0.1 mV/m. This map is based on measurements in towns and villages and the field strength in open country is likely to be in excess of the values indicated by the map. The actual median value in any particular town or village would lie within ± 10 dB of that shown.

Table 1 shows the measured median values together with the range of maximum to minimum values. All the towns and villages in the table have a population exceeding 1000.

(Derived from low-power experimental transmission)

Frequency: 199 Mc/s
Site height: 910 ft. (277m) AMSL
Aerial height: 594 ft. (181m) AGL
E. R. P.: 100 kW
Polarisation: Vertical

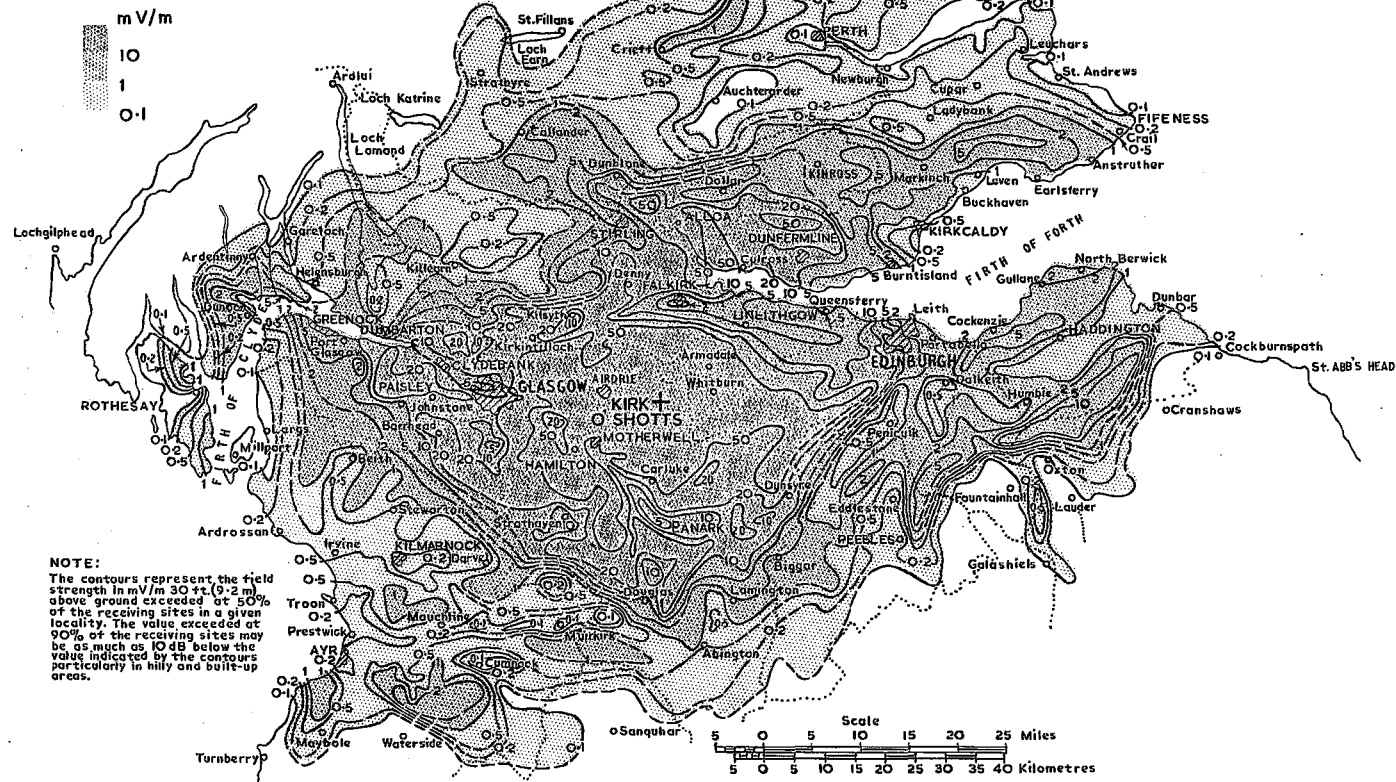


TABLE 1

Field Strength in mV/m at 30 ft (9.2 m) AGL

Town	Max.	Median	Min.
Aberdour	10	3.0	1.0
Aberfoyle	2.5	1.06	0.45
Aberlady	9.0	3.5	0.85
Airdrie	470	133	12
Alexandria	1.0	0.19	<0.1
Alloa	160	28	5.0
Alva	40	15	5.0
Alyth	0.65	0.35	0.16
Annbank	0.7	0.27	0.14
Anstruther	2.2	1.1	0.3
Arbroath	0.9	<0.1	-
Ardrossan	0.63	0.21	<0.1
Auchinleck	2.2	0.18	<0.1
Auchterarder	0.16	<0.1	-
Auchtermuchty	4.0	0.9	0.13
Ayr (South)	0.5	0.15	<0.1
(North)	0.7	0.2	<0.1
Bannockburn	20	7.0	2.8
Barrhead	56	21	6.3
Barry	1.0	0.45	0.25
Bathgate	300	60	22
Beith	0.9	0.45	0.2
Bellshill	200	80	28
Biggar	5.0	1.2	0.55
Bishopbriggs	63	11	4.5
Bishopton	35	18	10
Blairgowrie	1.0	0.2	<0.1
Bonhill	0.63	0.28	<0.1
Bo'Ness (West)	7.5	2.0	0.4
(South)	25	6.0	1.2
(East)	2.5	1.0	0.4
Brechin	<0.1	-	-
Bridge of Allan	120	25	8.0
Burnbank	224	45	1.6
Burntisland	20	5.0	1.0
Callander	4.2	1.7	0.58
Cardross	1.2	0.7	0.4
Carluke	280	40	10
Carnoustie	0.5	0.22	0.13
Carron	20	12	6.0
Clackmannan	40	13	5.0
Cleland	400	80	14
Coalburn	100	32	8.9
Coaltown of Balgonie	6.0	2.0	0.7
Coaltown of Wemyss	4.0	1.2	0.5

Town	Max.	Median	Min.
Coatbridge	250	53	7.5
Cockenzie	5.5	2.0	0.6
Coupar Angus	0.45	0.15	<0.1
Cowdenbeath (North)	7.0	1.8	0.7
(South)	35	4.5	0.8
Craik	0.7	0.3	0.13
Crieff	7.0	1.1	0.35
Crossgates	65	20	7.0
Crosshill	20	7.5	3.5
Croy	80	38	8.0
Cumbernauld	56	23	5.6
Cumnock	0.17	<0.1	-
Cupar	2.0	0.21	0.1
Dalkeith	2.0	0.3	0.13
Dalmellington	0.63	<0.1	-
Dalry (Ayr)	3.2	0.45	0.11
Darvel	0.84	0.32	0.18
Denny	32	11	7.1
Dollar	14	5.5	2.5
Douglas	8.9	3.2	1.4
Dreghorn	1.41	0.56	0.2
Dumbarton	12	1.6	0.45
Dumfries	0.17	<0.1	-
Dunbar	2.0	0.6	0.16
Dumblane	35	12.6	2.5
Dunfermline (North-west)	85	14	3.0
(North-east)	50	12	2.5
(Centre)	20	8.5	4.0
(South)	30	13	3.0
Dumipace	80	11	6.3
Dunlop	1.26	0.5	0.22
Dunoon	10	1.6	0.4
(Kirn)	18	7.9	3.2
(Hunter's Quay)	32	11	5.6
Duns	<0.1	-	-
Dysart	1.7	0.75	0.4
Eaglesham	110	35	10
Earlsferry	5.0	1.2	0.5
East Kilbride	180	63	14
East Linton	1.2	0.3	<0.1
East Wemyss	2.0	0.9	0.45
Falkirk (North)	7.0	2.2	0.85
(South)	5.5	1.2	0.55
Fauldhouse	60	32	12
Forfar	0.17	<0.1	-
Galashiels (North-east)	0.35	0.1	<0.1
(South-east)	0.11	<0.1	-
Galston (East)	0.22	0.1	<0.1
(West)	0.56	0.11	<0.1

Town	Max.	Median	Min.
Giffnock	35	6.3	0.9
Girvan	<0.1	—	—
Glenboig	180	126	50
Glencraig	7.0	2.0	0.85
Glengarnock	1.06	0.45	0.24
Gorebridge	7.5	2.0	0.5
Gourock	22	1.6	0.25
Grangemouth	25	10.5	4.5
Greenfaulds	80	50	13
Greengairs	335	150	28
Greenock	75	7.9	0.8
Gullane	7.0	2.1	0.7
Haddington	1.3	0.45	0.15
Hamilton	300	56	14
Harthill	600	360	150
Hawick	<0.1	—	—
Helensburgh	1.5	0.53	0.28
Hurlford	0.53	0.18	<0.1
Inverkeithing	3.0	1.5	0.7
Inverkip	0.35	0.13	<0.1
Irvine (South-west)	0.8	0.34	0.18
(South-east)	0.9	0.45	0.1
(North)	0.9	0.35	0.13
Jamestown (Dumbarton)	0.5	0.27	0.16
Johnstone	28	8.0	2.8
Kelso	<0.1	—	—
Kelty	4.0	1.7	0.8
Kilbirnie	3.2	0.5	0.16
Killearn	2.8	0.75	0.28
Killin	0.45	0.18	<0.1
Kilmacolm	4.5	1.26	0.45
Kilmarnock (East)	0.27	0.11	<0.1
(South)	0.63	0.19	<0.1
(West)	0.47	0.18	<0.1
(North)	0.89	0.25	<0.1
Kilmaurs	0.42	0.2	<0.1
Kilsyth	25	7.9	4.2
Kilwinning	1.0	0.42	<0.1
Kincardine	150	50	15
Kinghorn	7.0	0.6	0.25
Kinross	3.0	1.3	0.65
Kippen	2.2	1.0	0.47
Kirkcaldy (Centre)	0.22	0.1	<0.1
(North Central)	1.8	0.65	0.22
(South Central)	1.0	0.2	<0.1
(Linktown)	0.65	0.14	<0.1
(Sinclairstown)	12	1.8	0.5
Kirkintilloch	126	25	5.0
Kirriemuir	0.45	<0.1	—

Town	Max.	Median	Min.
Ladybank (Fife)	2.0	0.75	0.25
Lanark	40	6.0	2.8
Larbert	50	11	5.0
Largs	0.16	<0.1	-
Larkhall	280	50	11
Lasswade	2.0	0.4	0.13
Laurieston (Stirling)	15	3.5	1.3
Law	280	126	45
Lennoxtown	63	19	8.9
Leslie (Fife)	3.5	1.5	0.6
Lesmahagow	100	16	6.3
Leven	1.6	0.6	0.18
Linlithgow	15	2.7	0.65
Loanhead	2.0	1.0	0.3
Lochgelly	20	7.0	2.0
Lochmaben	<0.1	-	-
Lochwinnoch	6.3	1.1	0.25
Lockerbie	0.11	<0.1	-
Longforgan	1.3	0.75	0.4
Markinch	7.5	2.0	0.8
Mauchline	1.3	0.2	<0.1
Maxwelltown	0.14	<0.1	-
Maybole	0.7	0.28	0.11
Melrose	0.5	0.17	<0.1
Menstrie	140	95	50
Milnathort	5.0	2.0	0.75
Milngavie	56	13	2.2
Milton of Campsie	180	90	28
Moffat	<0.1	-	-
Monifieth	0.6	0.27	0.12
Montrose	0.1	<0.1	-
Mossend	200	95	32
Motherwell	320	35	10
Muirkirk	0.25	<0.1	-
Musselburgh	3.5	1.1	0.5
Muthill	0.5	0.16	<0.1
Netherton (Lanark)	100	63	20
Newarthill	315	100	32
New Cumnock (Town)	0.45	0.1	<0.1
(Connel Park)	1.0	0.16	<0.1
Newmains	450	126	14
Newmilns	1.0	0.27	<0.1
Newport (Fife)	0.15	<0.1	-
Newton Grange	2.5	0.7	0.35
Newton Mearns	22	14	2.2
North Berwick	4.0	0.7	0.2
Old Kilpatrick	28	5.3	1.1
Patna	0.45	<0.1	-

Town	Max.	Median	Min.
Peebles	0°35	0°16	<0°1
Penicuik	2°0	0°48	0°1
Perth (West)	0°3	<0°1	-
(South)	0°2	<0°1	-
(Centre)	0°5	<0°1	-
(North-east - Bridgend)	0°7	0°25	0°1
Port Glasgow	11	3°2	0°7
Prestonpans	10	4°5	1°5
Prestwick	0°45	0°14	<0°1
Queensferry	7°0	1°5	0°4
Rattray	1°3	0°4	<0°1
Renton	1°4	0°5	0°18
Rhu	0°89	0°45	0°18
Rosewell	3°0	0°6	0°22
Rosyth	25	3°0	1°0
Rothsay	1°2	<0°1	-
St. Andrews	0°25	<0°1	-
St. Ninians	18	10	3°5
Saltcoats	0°9	0°24	<0°1
Sandbank	10	5°0	1°6
Sanquhar	0°4	<0°1	-
Selkirk	<0°1	-	-
Shieldhill (Stirling)	65	17	4°0
Skelmorlie	0°2	0°1	<0°1
Slamannan	140	70	28
Stenhousemuir	40	17	7°0
Stevenston	1°3	0°35	0°11
Stewarton	0°7	0°28	0°13
Stirling (North)	35	9°0	2°2
(South)	28	9°0	2°2
Stonehouse	100	40	9°0
Stoneywood	60	24	12
Strathaven	32	7°0	1°4
Tayport (North)	0°1	<0°1	-
(South)	0°28	0°16	<0°1
Thornhill (Dumfries)	0°55	0°2	0°11
Thornhill (Perth)	6°7	1°4	0°25
Thornton (Fife)	2°5	1°1	0°5
Tillicoultry	30	8°5	2°8
Tranent	8°5	2°2	1°1
Troon	1°8	0°25	<0°1
Tullibody	150	56	20
Wattston	335	150	50
West Kilbride	0°32	0°1	<0°1
Whitburn	300	180	70
Winchburgh	10	5°0	1°8
Windygates	3°0	0°85	0°3
Wishaw	110	25	5°6

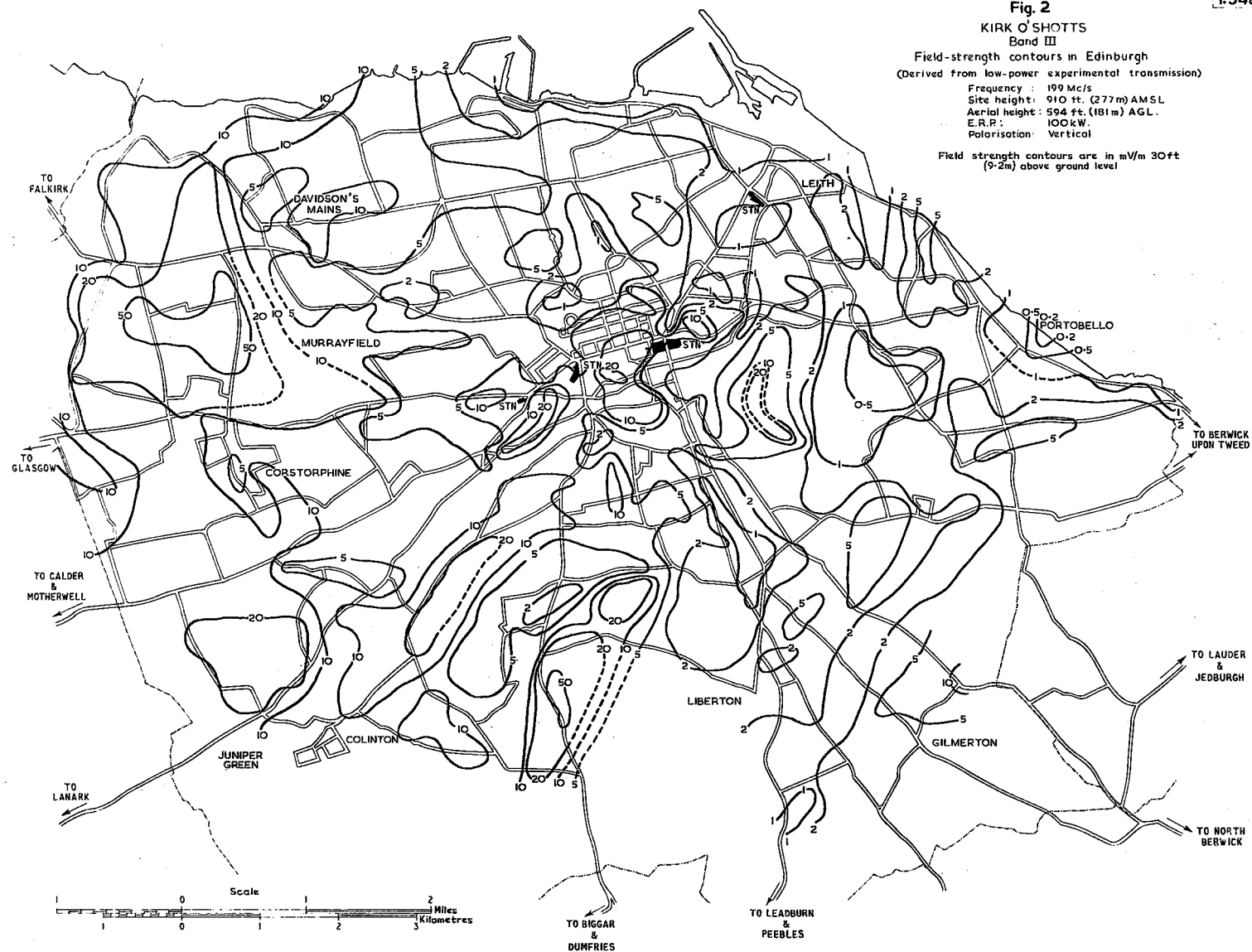
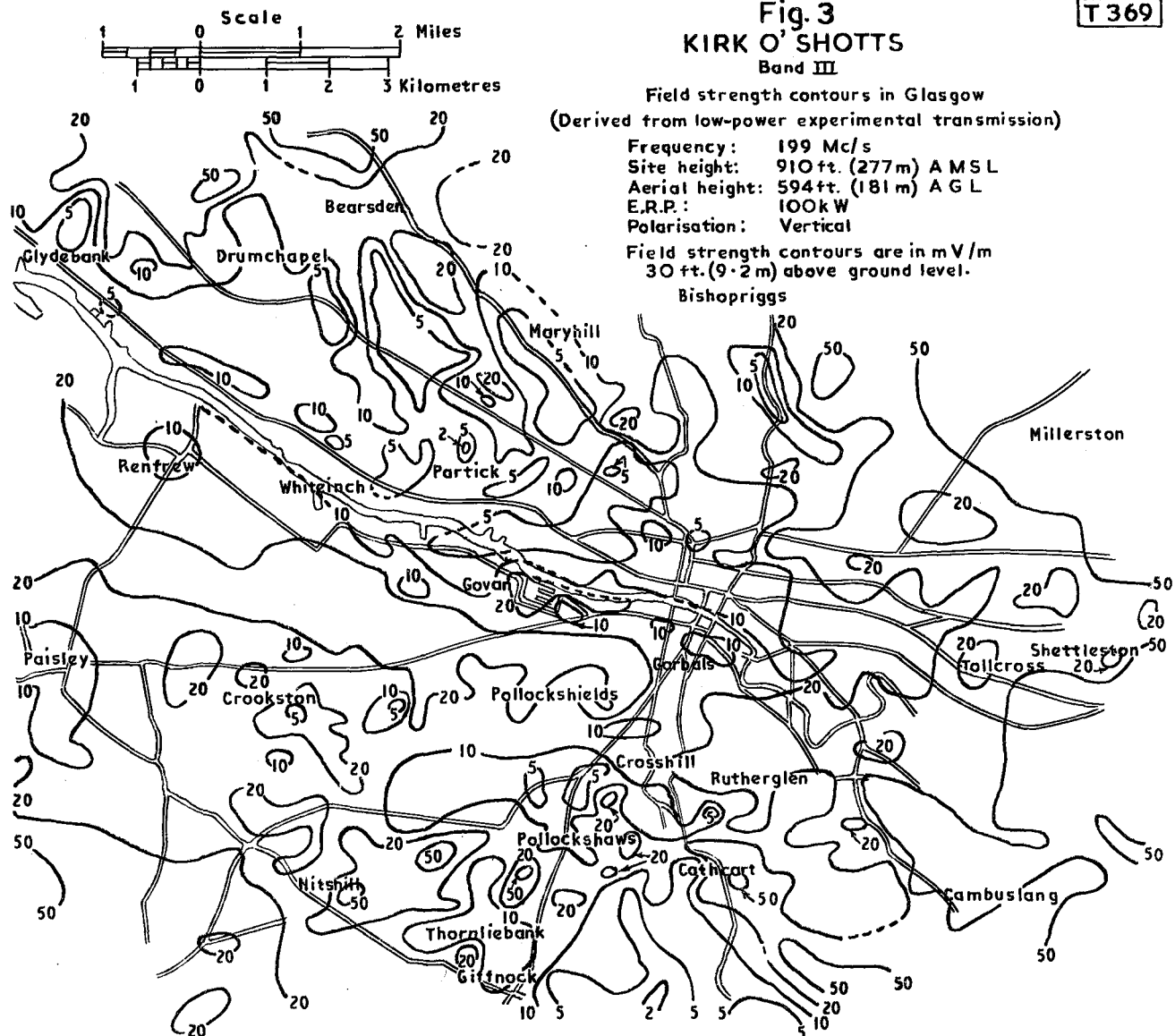
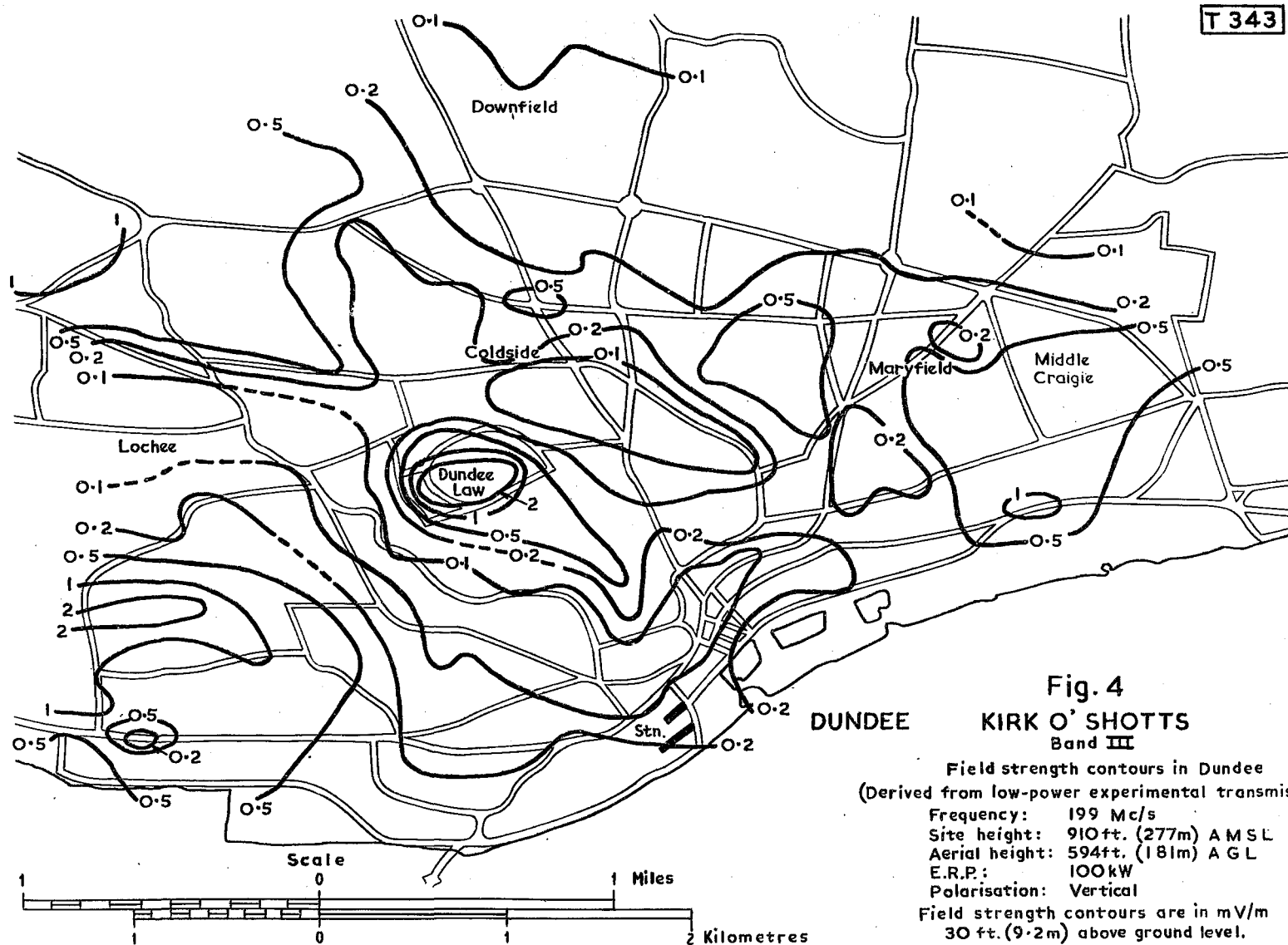


Fig. 3
KIRK O' SHOTTS
 Band III





Referring to Fig. 1 it will be seen that most of the highly populated areas in the central counties of Clackmannan, Kinross, Lanark, West and East Lothian, Midlothian, Renfrew and Stirling would be within the 0.5 mV/m contour. Small areas in Midlothian, such as Penicuik and Dalkeith, are screened by the Pentland Hills and would receive less than 0.5 mV/m.

Most of Fifeshire would be within the 0.5 mV/m contour, except for an area around Kirkcaldy and the north-east corner including St. Andrews.

Ayrshire is poorly served and most of the county is outside the 0.5 mV/m contour.

Detailed measurements were made in Edinburgh, Glasgow and Dundee, as shown in Figs. 2, 3 and 4 (maps T.348, T.369 and T.343) respectively. The contours show the median values of field strength and the accuracy of the measurements is such that actual values for 95% of the localities will be within ± 6 dB of the value indicated.

It will be seen that only a small area of Glasgow receives a median field strength below 2 mV/m. In Edinburgh only small areas behind Arthur's Seat and in Portobello would receive a median value of less than 0.5 mV/m. Dundee would not be very well served and only small areas on high ground in the town would receive a field strength of greater than 0.5 mV/m.

3. CONCLUSIONS

A Band III television transmitter sited at Kirk o' Shotts with an e.r.p. of 100 kW would give a satisfactory service in Glasgow and most of Edinburgh. Areas within a distance of approximately 30 miles (48 km) from Kirk o' Shotts would be within the 0.5 mV/m contour.

The towns of Dundee, Perth and Ayr would have a median field strength very much less than 0.5 mV/m.